Prospects after the voting reform of the Lisbon Treaty*

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Abstract

The European Union used to make decisions by unanimity or near unanimity. After a series of extensions, with 27 member states the present decision making mechanisms have become very slow and assigned power to the members in an arbitrary way.

The new decision rules accepted as part of the Lisbon Treaty did not only make decision making far easier, but streamlined the process by removing the most controversial element: the voting weights. The new system relies entirely on population data. We look at the immediate impact of the reform as well as the long term effects of the different demographic trends in the 27 member states.

We find that the Lisbon rules benefit the largest member states, while medium sized countries, especially Central Eastern European countries suffer the biggest losses.

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1 Introduction

The European Union with over 500 million citizens generates annually roughly one third of the world's nominal output. Half a century ago it started as an

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economic cooperation between 6 European countries, today, with 27 members it is one of the largest and economically most powerful unions on the globe.[1] Unfortunately the efforts to deepen the cooperation have been hampered by the complicated processes of decision making paralysed by safety measures ensuring that no group of countries can be exploited by others.

The Council of Ministers (CM) is the principal decision making body of the European Union. In the CM each country is represented by a single individual, who casts a *weighted* vote to account for the heterogeneity in countries. Under the pre-Lisbon voting rules a motion can be approved by a group of countries only when certain conditions on the total votes, the total population and the number of supporting countries is met.

While the entire voting process has been subject to criticism, the first condition is especially controversial. The weighted votes have been assigned as an indication of country sizes. Larger countries received larger weights, but the exact weights have been determined in a largely arbitrary political process. The Case of Luxembourg in 1958 is a well-known example: despite having as much as 25% of the votes Germany had, which seems to be excessively favourable for a country with less than 1% of its population, Luxembourg ended up being a dummy player, that is, having no influence whatsoever on the decision making. While we can attribute this largely to some unfortunate details of the decision making rules (an odd quota would have solved the problem), less extreme examples are known from more recent years, too. In 1958 Belgium and the Netherlands each having approximately 10 million inhabitants, were treated equally. This remained so until recently despite a difference of over 60% in present populations. Such changes require the continuous updating of the voting weights keeping member countries in a persistent debate.

The Treaty of Lisbon attempts to solve the two issues at once. The idea was to remove the voting weights and create a voting system that is both fair, simple and requires no adjustments should the EU accept new members or should the populations change dramatically.

In this brief paper we look at the effect of the voting reform on the individual countries' influence on decision making both on the short and long term. We use two well-known measures of voting power: the Shapley-Shubik index (Shapley and Shubik, 1954) and the Banzhaf index to measure this influence. Our long term calculations are based on the population forecasts of Eurostat. Ours is not the first to analyse the new voting system in the Council, but unlike Felsenthal and Machover (2007) or Turnovec (2008) we look also at the long term effects and use the most recent population estimates.

[1]For a strategic analysis of the more recent extensions see Kóczy (2010).

Since the voting rules under the Lisbon treaty are *based on* population data, voting power is very sensitive to these values.

The paper is then structured as follows. We define power indices and generally explain the voting power approach. Then we explain the decision making both before and after the reform. We present the results of our calculations together with some comments.

2 Power indices

In this section we explain the method we use to measure power. Our approach is formal, based on statistics and game theory. For the subsequent calculations the definitions of power indices are sufficient, but for reference we add some motivation of using these indices.

In a voting situation the rules of legislation determine which groups of voters can accept a motion and which are the ones that cannot. We refer to the former group as *winning coalitions*. Formally let N denote the set of voters and then a subset $S \subseteq N$ is winning if it is sufficient to approve a motion. It is standard to assume that the set of winning coalitions includes N, that is, the grand coalition can always approve a proposal, while the empty coalition $\varnothing$ can never approve one. W also assume that for all winning coalitions S a more inclusive coalition $T \supset S$ is also winning.[2] Finally, we assume that two decisions cannot be approved simultaneously, that is, if S is winning, then its complementer $N \setminus S$ is not, and hence neither are its subsets.

While the first approach to measure voting power Penrose (1946) comes from the realm of statistics, the approach we take today comes from cooperative game theory. Indeed the voting situation can be seen as a simple characteristic function form game with transferable utility with a number of additional conditions. Such a game $v : 2^N \longrightarrow \{0, 1\}$ assigns to each coalition a value of either 1 or 0 – 1 for winning and 0 for losing coalitions. Our assumptions above convert into the following formal properties:

1. $v(\varnothing) = 0, v(N) = 1$,
2. if $S \subseteq T$ then $v(S) \leq v(T)$,
3. if $v(S) = v(T) = 1$ then $S \cap T \neq \varnothing$.

We study the *marginal contribution* of voters: the added value of voter j in some coalition $S \subseteq N \setminus \{j\}$. When the marginal contribution is 0, voter j

[2]This assumption how natural it may seem is not the

is either joining a coalition that is already winning or the coalition remained losing even after j has joined. The interesting cases are those where the marginal contribution is 1, that is, where j converts a losing coalition into a winning one. Perhaps j was just at the right place at the right time. If on the other hand this happens often, for different coalitions, j changes decisions often.

Now, there are two interpretations of voting power (Felsenthal and Machover, 1998, 2004). When we compare different voting situations we want to understand the effectiveness of the same player in making or changing decisions. This is captured by the *influence* power, or I-power of players. The influence power is informative about the chance of getting a concept into the legislation, but it ignores other voters' similar efforts. Alternatively we assume that voters vote to get a bigger slice of a cake. When voters share a prize we use P-power. The latter is particularly useful for comparing the power of different voters and to study this comparison across different voting schemes. While the I-power is interesting if we want to know a member country's ability to add a new rule on the member countries' budgetary discipline, we must use P-power to calculate the chunk of the EU budget a member can expect to control. Note that we use a priory measures, so we assume that the issues to be voted on and the voters' relevant policy positions are not known at the time of our calculations.

We use the Shapley-Shubik index (Shapley and Shubik, 1954) to calculate the P-power. The index is actually an application of the Shapley value (Shapley, 1953) to proper simple games. Voters arrive in a random order; if and when a coalition turns winning the full credit is given to the last arriving, the *pivotal* player. A player's power is given as the proportion of orderings where it is pivotal.

$$\phi_i = \sum_{S \subseteq N} \frac{(|S|-1)!(|N|-|S|)!}{n!}(v(S) - v(S \setminus \{i\}))$$

The *Banzhaf measure* ψ (Penrose, 1946; Banzhaf, 1965) is the vector of probabilities that a voter is *critical* for a coalition, that is, the probabilities that it can turn a winning coalition into a losing one, formally

$$\psi_i = \frac{\eta_i(v)}{2^{n-1}},$$

where $\eta_i(v)$ is the *Banzhaf score*, the number of coalitions in v in which i is critical. When normalised to 1, we get the *Banzhaf index* β (Coleman, 1971):

$$\beta_i = \frac{\eta_i(v)}{\sum_{j \in N} \eta_j(v)}.$$

Which of these measures should be used is a difficult question. Straffin (1977) shows that the two indices can be supported by similar probabilistic models. In these models voters support a motion with a certain probability, and while for the Banzhaf measure the probability is chosen independently for each voter, in the case of the Shapley-Shubik index the probability is common for all voters. In practice, when the voters have in general rather similar preferences the latter should be preferred. In our case the choice remains difficult as we are, after all, talking about a union with voluntary membership, but on the other hand we have seen heated debates and there are certainly marked differences between some of the countries. In the absence of a richer model, it is usual to report power indices based on each of these measures and we will do the same here.

3 The voting reform

The Council of Ministers is the European Union's main decision making body. The Council consists of a single representative of each member state, but when the votes are cast their weight might differ. This is different from the weighted voting in, for instance, a national assembly, where the weights are naturally provided by the number of representatives. The qualified majority voting used in the Council allows for flexible, some might say: arbitrary rules on what are the winning coalitions. In the following we explain the rules applied before and after the Reform Treaty.

3.1 Treaty of Nice

Under the Treaty of Nice a coalition of countries must satisfy *all* of the following 3 conditions in order to be able to pass a decision:

- The coalition must consist of the majority[3] of countries (where each country has a single "vote").
- The coalition must cast at least 74% of the votes.
- The coalition must have at least 62% of the population.

Choosing the weights for the individual countries is not easy task, the Treaty of Nice was preceded by long negotiations. Leech (2002) gives a detailed investigation of different extension scenarios including a discussion on the

[3]The required majority is 50% in most cases, with the exception when the Council is not acting on a proposal of the Commission: such cases require a two-third majority.

significance of quotas, that is, the required majority. Felsenthal and Machover (2001) argue that the quotas were simply set too high, paralysing EU decision making.

3.2 Treaty of Lisbon

The Treaty of Lisbon abolished the artificial and much debated weighted system and replaced it with one, based on population data. Under the new treaty the decision must be supported by a coalition of countries that satisfies at least one of the following conditions:

- The majority of countries (55% or 72% in special cases) representing at least 65% of the population, *or*
- No more than 3 countries are against the proposal.

Without the second condition any 3 of the 4 largest countries could, by themselves block a proposal. While such divisions between the large and the small members of the EU do not really occur, this condition was included as a safeguard against a possible alliance of the largest members.

The Treaty specifies that until 31 October 2014 the Nice rules will be used. After this date the new rules should be used, but "Between 1 November 2014 and 31 March 2017, when an act is to be adopted by qualified majority, a member of the Council may request that it be adopted in accordance with the qualified majority..."[4], in other words, according to the Nice rules. While secondary sources (e.g. Mahony, 2007) cite this part of the treaty in a more neutral tone: "the original sysyem [*sic!*] under Nice can still be used to take decisions if a member state thinks it necessary" the possibility only applies to the *adoption* of an act and not to the rejection. Should it also apply to the latter, we would be back to the Nice rules as in cases where there is a difference there is always a voter on one of the sides who finds the old rules more favourable.

In sum, during the transition period an act can be approved by either of the two systems.

3.3 The "Jagiellonian Compromise"

Penrose (1946) has shown that the one man-one vote idea of equity can best be achieved in an international decision making body by giving each voter a weight proportional to the square root of its population. This idea was

[4]Treaty of Lisbon, Protocol on Transitional Provisions, Provisions concerning the qualified majority, §3.2.

		number		population	votes
Nice	–31 October 2014	50%	14	62%	74%
Transition	31 October 2014	50%	14	62%	74%
	–	55%	15	65%	
	31 March 2017	n-3	24		
Lisbon	31 March 2017–	55%	15	65%	
		n-3	24		

Table 1: A comparison of voting rules

advocated in the case of the EU Council of Ministers by Słomczyński and Życzkowski (2004, 2006) who proposed a quota of 62% as giving the most equitable representation.

Słomczyński and Życzkowski (2004) argued that the proposal does not *ex ante* favour any of the member states, its principles are clear and mathematically sound. The square-root model would give a scientific approach that at the same time would provide effectiveness of 16.6%, that, as we will see well exceeds the decisiveness of any of the previous models. In practice this means that 1 out of 6 coalitions can make a decision. The proposal was put forward as a "compromise," as it gives a larger influence for the largest, smaller influence for medium sized countries, but not to the extent of the Lisbon rules. On the other hand for many of the member states the square-root model is actually the best and only Italy and Spain and, when we look at the Banzhaf indices, some of the smallest countries would suffer under that rule. It is therefore somewhat surprising that while the majority of countries should prefer the Jagellonian proposal, it was not seriously considered.

4 Data and software

Already in the Nice rules populations are mentioned as a condition for a coalition to be winning, but in the Lisbon rules populations take the leading role to determine a country's influence in voting. In our estimates of voting power we use the population forecasts of Eurostat, the statistical institute of the European Union. "Eurostat's population projections is one of several possible population change scenarios based on assumptions for fertility, mortality and migration. The method used for population projections is the "cohort-component" method" (Eurostat, 2009) that divides the population into age-sex cohorts and accounts for the fertility, mortality, and migration behaviour of each of these cohorts. (George, Smith, Swanson, and Tayman, 2004)

Country	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Austria	84	86	87	89	90	91	91	91	91	91	90
Belgium	108	111	113	115	117	119	120	121	122	122	123
Bulgaria	76	74	72	70	68	65	63	61	59	57	55
Cyprus	8	9	10	10	11	11	12	12	13	13	13
Czech Rep.	104	105	105	105	104	103	102	100	99	97	95
Denmark	55	56	57	57	58	59	59	59	59	59	59
Estonia	13	13	13	13	13	12	12	12	12	12	11
Finland	53	54	55	55	56	56	55	55	54	54	54
France	626	642	656	668	680	690	699	706	710	714	718
Germany	821	819	815	809	802	791	778	762	745	726	708
Greece	113	115	116	116	116	116	116	115	114	113	111
Hungary	100	100	99	98	97	95	94	92	91	89	87
Ireland	46	51	54	57	59	61	62	64	65	67	68
Italy	600	609	614	617	619	620	620	618	612	604	594
Latvia	22	22	22	21	20	20	19	19	18	17	17
Lithuania	33	33	32	32	31	30	29	28	27	26	25
Lux.	5	5	6	6	6	6	7	7	7	7	7
Malta	4	4	4	4	4	4	4	4	4	4	4
Netherl.	165	167	169	171	172	173	172	171	169	167	166
Poland	381	381	380	376	370	361	352	343	333	322	311
Portugal	107	109	111	112	113	114	115	115	114	114	113
Romania	213	211	208	205	200	196	192	187	181	176	169
Slovakia	54	54	54	54	53	52	51	50	49	47	45
Slovenia	20	21	21	20	20	20	20	19	19	18	18
Spain	467	494	511	521	527	530	533	534	532	527	519
Sweden	93	96	99	101	103	104	105	106	107	108	109
UK	620	638	657	675	692	707	720	733	745	756	767
Total	**4 994**	**5 077**	**5 138**	**5 178**	**5 199**	**5 207**	**5 201**	**5 184**	**5 153**	**5 110**	**5 057**
62%	3 096	3 148	3 186	3 210	3 223	3 228	3 225	3 214	3 195	3 168	3 135
65%	3 246	3 300	3 340	3 366	3 379	3 385	3 381	3 370	3 349	3 322	3 287

Table 2: Population forecasts in 100000's (Source: Eurostat (2009)

	Shapley-Shubik index			Banzhaf index		
	Lisbon	Penrose	Nice	Lisbon	Penrose	Nice
Austria	2,08%	3,06%	2,80%	2,58%	3,16%	3,09%
Belgium	2,56%	3,56%	3,39%	2,92%	3,63%	3,68%
Bulgaria	1,57%	2,40%	2,80%	2,21%	2,52%	3,09%
Cyprus	0,91%	1,24%	1,09%	1,76%	1,38%	1,25%
Czech Republic	2,17%	3,13%	3,39%	2,63%	3,22%	3,68%
Denmark	1,60%	2,49%	1,95%	2,25%	2,60%	2,18%
Estonia	0,89%	1,15%	1,09%	1,74%	1,29%	1,25%
Finland	1,52%	2,38%	1,95%	2,20%	2,50%	2,18%
France	12,47%	8,89%	8,75%	9,91%	8,41%	7,78%
Germany	12,72%	8,82%	8,75%	9,79%	8,35%	7,78%
Greece	2,42%	3,38%	3,39%	2,80%	3,46%	3,68%
Hungary	2,05%	3,00%	3,39%	2,55%	3,10%	3,68%
Ireland	1,72%	2,65%	1,95%	2,35%	2,77%	2,18%
Italy	10,20%	8,02%	8,70%	8,54%	7,66%	7,78%
Latvia	0,97%	1,39%	1,09%	1,81%	1,52%	1,25%
Lithuania	1,10%	1,67%	1,95%	1,89%	1,81%	2,18%
Luxembourg	0,82%	0,96%	1,09%	1,70%	1,10%	1,25%
Malta	0,78%	0,75%	0,81%	1,67%	0,89%	0,94%
Netherlands	3,28%	4,13%	3,67%	3,36%	4,16%	3,97%
Poland	5,53%	5,69%	7,98%	4,28%	5,60%	7,42%
Portugal	2,44%	3,41%	3,39%	2,82%	3,49%	3,68%
Romania	3,43%	4,17%	3,98%	3,39%	4,20%	4,26%
Slovakia	1,42%	2,19%	1,95%	2,10%	2,32%	2,18%
Slovenia	0,98%	1,41%	1,09%	1,82%	1,55%	1,25%
Spain	8,61%	7,46%	8,05%	7,68%	7,18%	7,42%
Sweden	2,34%	3,35%	2,80%	2,78%	3,43%	3,09%
United Kingdom	13,40%	9,23%	8,75%	10,48%	8,69%	7,78%

Table 3: Projected power in 2060: Lisbon rules in comparison with the Penrose square-rule and the Nice status quo.

The forecasts are available for every 5 years between 2010 and 2060 and are shown in Table 2.

The calculations are made using Indices of Power (IOP) 2.0 (Bräuninger and König, 2005), a simple program that allows for complex voting rules allowing for double majority and multiple alternative conditions to meet approval criteria. Originally written to handle weighted voting where the main roles have been played by the voting weights, normally small integers and it cannot handle large weights such as populations. As a compromise population data are entered in 100000's that may have a minor effect on the indices found.

	Shapley-Shubik index				Normalised Banzhaf value			
	2010	2015	2020	2060	2010	2015	2020	2060
Bulgaria	2,81	1,81	1,79	1,57	3,09	2,40	2,34	2,21
France	8,71	11,17	11,20	12,47	7,78	8,98	9,17	9,91
Germany	8,76	15,04	15,12	12,72	7,78	11,31	10,98	9,79
Hungary	3,40	2,21	2,20	2,05	3,68	2,71	2,67	2,55
Lithuania	1,95	1,19	1,18	1,10	2,18	1,92	1,90	1,89
Malta	0,81	0,75	0,75	0,78	0,94	1,57	1,57	1,67
Poland	7,99	6,52	6,53	5,53	7,42	5,35	5,05	4,28
U. K.	8,71	11,09	11,11	13,40	7,78	8,93	9,26	10,48
decisiveness					2,03	12,80	12,70	12,71

Table 4: Power indices for selected countries in selected years

5 Results

We are interested in three effects. Firstly, whether and to what extent are the new voting rules able to improve the EU's decisiveness. As Hosli (2008) observed and discussed in detail the days when the EU could make decisions by unanimity are over. Second, we want to see a better equity among European citizens. Finally any change will have winners and losers. We are also interested in the "dynamic equity" the possible loss of acquired rights.

5.1 Improved decisiveness

The results for the calculations are summarised in Table 4 for selected years and selected countries – for the complete dataset see Tables 6 and 7. Most importantly we can see that the probability of decisiveness has increased dramatically. While in the Nice system about 1 out of 50 coalitions of countries

could approve a decision, under the new system this increases to more than 1 out of 8.[5] Naturally, the best period is between 2014 and 2017, when either of the rules can be applied to approve a decision. The gain, however, is rather small. There are in total $2^{27} - 1$ or over 134 million possible coalitions among the 27 member states, of which only about 2500 are decisive under the old, but not under the new rules. This seems like a fair price to abandon a complicated system.

5.2 On representation

The increased decisiveness on the other hand means that there are many (millions) of additional coalitions that are now winning. Not all members benefit from these changes equally. One of the criticisms of the old system was the enormous differences between the influence of an individual citizen depending on his citizenship. While this is hardly avoidable in such a complex situation, the severity of the problem is striking. Citizens of Luxembourg or Malta have about 20 times as much influence as citizens of Germany. Interestingly the two former members are also the largest recipients of EU funds on a per capita basis (European Parliament, 2010). Has this improved?

Before we can answer this question, we must decide on the benchmark: what would be the fair allocation of power? Penrose (1946) has in his already mentioned result established the Penrose square-root rule, stating that the voting weights should be proportional to the square root of the populations. We have presented the power in this benchmark scenario as well as the pre- and post-reform powers in Table 3. It is apparent that the new power distribution is further from the ideal. Taking the (unweighted quadratic) average difference as a measure of distance, the Lisbon rules are 2 (Banzhaf index) to 7 (Shapley-Subik index) times less equal.

One could say that the Penrose square rule is politically unacceptable and so it is also interesting to see a comparison with another benchmark, where we want to have power to be proportional to the populations. So let us see how the reform fares with respect to this benchmark that the decision makers may have used. Here the conclusions are somewhat different when looking at the Shapley-Shubik (Table 6) or normalised Banzhaf indices (Tables 7). Looking at the first we find that the overall changes are very favourable: the representation of Germany dramatically improves, in fact, by 2060 Spain becomes the worst represented country and while Malta's representation does not decrease much, after the reform Maltese citizens have

[5]For a reference point note that in a simple majority setting a coalition or its complementer has the majority of the votes and so the ratio is 1 to 2.

only about 10 times as much influence as the citizens of a larger country. In the case of the Banzhaf index, yet again, Germany's representation improves much, overtaking France, Poland and the UK, too, but on the other hand the representation of smaller countries improves, so that by 2060 Maltese citizens have over 30 times the influence of their British peers. It could well be that we talk about some outliers. Unfortunately this is not the case: the (unweighted quadratic) average distance from equal representation more than doubles for the Banzhaf index.

	Shapley-Shubik				Banzhaf		
	reform	pop.	total		reform	pop.	total
U. K.	27%	21%	54%	Malta	67%	6%	77%
Germany	72%	-15%	45%	Slovenia	42%	3%	45%
France	28%	12%	43%	Latvia	43%	1%	45%
Italy	21%	-3%	17%	Cyprus	30%	8%	41%
			..	Estonia	34%	4%	39%
Luxembourg	-30%	7%	-25%	Luxembourg	26%	8%	36%
Austria	-29%	4%	-26%	U. K.	15%	17%	35%
Portugal	-23%	-6%	-27%	France	15%	10%	27%
Slovakia	-31%	4%	-28%	Germany	45%	-13%	26%
Greece	-28%	-1%	-29%				
Poland	-18%	-15%	-31%	Greece	-22%	-3%	-24%
Czech Rep.	-33%	-5%	-36%	Bulgaria	-22%	-8%	-29%
Hungary	-35%	-7%	-40%	Czech Rep.	-25%	-5%	-29%
Lithuania	-39%	-8%	-44%	Hungary	-26%	-6%	-31%
Bulgaria	-36%	-13%	-44%	Poland	-28%	-20%	-42%

Table 5: The most drastic relative changes in the power indices. (The effect of the population change refers to the period until 2060.)

5.3 Winners and losers

As long as we are interested in shares of voting power, any change will benefit some member countries and harm others. Who the winners and losers are depends on the details of the change (Baldwin and Widgrén, 2004). In the following we look at the effects of the voting reform.

The changes we have so far discussed are due to the change in the voting system, but also due to population changes. Bulgaria, Latvia and Lithuania lose around a quarter of their population, the UK gains that much, while Cyprus, Luxembourg and Ireland are predicted to gain more than 50% of

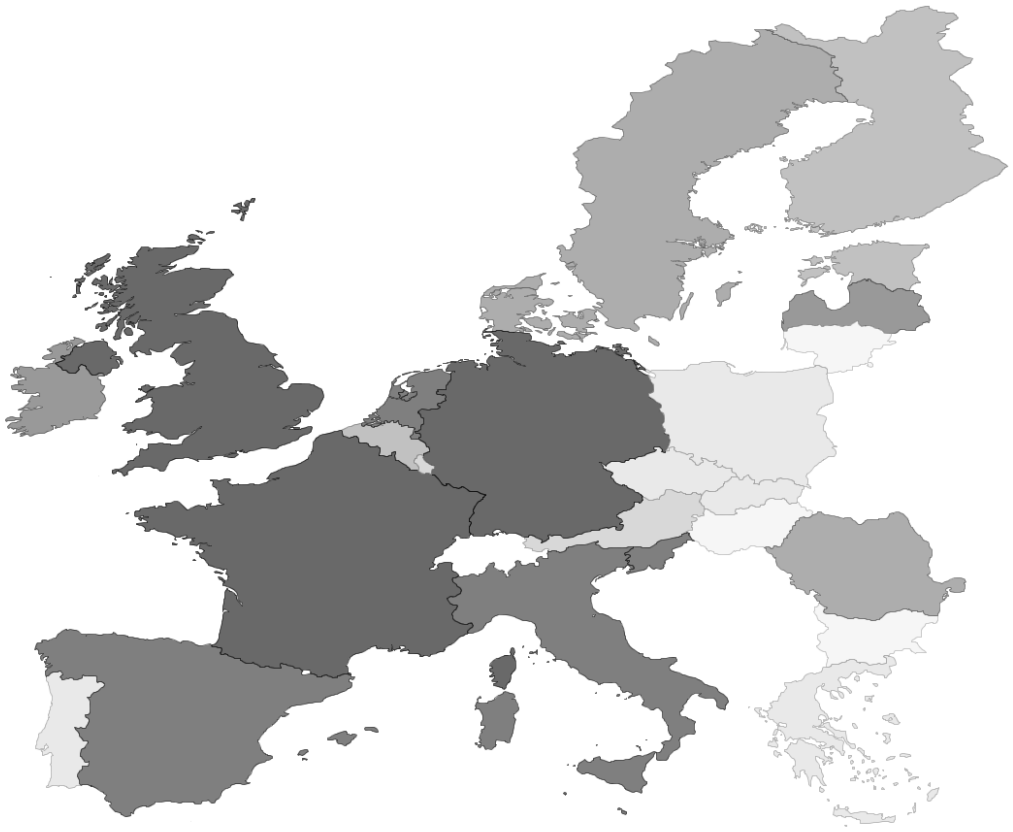

Figure 1: Cartogram showing the *relative change* in Shapley-Shubik indices. The area of each country is scaled by the relative change of power. Darker shades indicate a higher ratio. Note that the areas of Poland and Germany should be similar or that Bulgaria should be Latvia twice.

theirs. The effect of the new system, observable at the 2015 values is drastic for the largest countries, Germany gaining nearly 80%, while some middle-sized countries: Bulgaria, Hungary, Lithuania lose the most 35-40% of their power for the Shapley-Shubik index. If we look at the normalised Banzhaf, the largest *and* the smallest countries gain, the biggest losses are recorded for Hungary, Poland, the Czech Republic. Overall the same countries, together with Bulgaria lose the most power. While Poland and the Czech Republic were among the last ones, interestingly Hungary was the first one to ratify the treaty, it took her no more than 9 days and less than an hour of discussion.

Arguably these changes are not due to the reform, but to unfavourable demographic changes. This may be true, but before the reform the popula-

tions rarely mattered and the population forecasts were known at the time of signing the treaty.

Finally we make two observations. Firstly, the effects are sometimes just the opposite for Shapley-Shubik and Banzhaf indices. Luxembourg is an exemple that loses according to Shapley-Shubik, but wins according to Banzhaf. Estonia is a country with a slowly but steadily decreasing population, yet its Banzhaf power has the opposite trend.

Second, it is interesting to note, how certain groups of countries benefit more than others. The biggest losers of the reform are all *recipients* from the budget. Based on the Shapley-Shubik indices the share of the biggest per capita recipients goes down from 40% to 28%, the major contributors gain power from 29% to 35%. Looking at other groups, we find that the 4 largest countries presently having about a third of the influence increase their share to nearly half. Central and East European Countries (the Visegrád countries together with Romania and Bulgaria) presently decide about 1 in 4 decisions. By 2060 this share goes down to 1 in 6 looking at the current trends.

6 Conclusions

One of the objectives of the Treaty of Lisbon was to reform the slow, increasingly impotent decision making of the European Union. This task was completed with success making it about 6 times easier to reach a decision. The changes were also made with the intention to make the decision making more fair, allowing all European citizens to have the same influence on the decision making. Here the success was more moderate halving the past inequalities even if we look at the Shapley-Shubik index, while the normalised Banzhaf value reports a worsening of the situation.

The changes do not affect all countries equally. The large countries are clear beneficiaries of the changes: the mechanisms to limit their influence have been mostly removed. The countries that suffer most from the changes are surprisingly not the smallest ones, but the countries in Central and Eastern Europe, where a combination of the reform together with unfavourable demographic changes mean that in 50 years they will have much less influence than what they have today.

References

Baldwin, R., and M. Widgrén (2004): "Winners and Losers Under Various Dual Majority Rules for the EU Council of Ministers," CEPR Discus-

sion Paper 4450, Centre for Economic Policy Research, London.

Banzhaf, III., J. F. (1965): "Weighted voting doesn't work: A mathematical analysis," *Rutgers Law Review*, 19(2), 317–343.

Bräuninger, T., and T. König (2005): *Indices of Power IOP 2.0 [computer program]*/University of Konstanz, Konstanz.

Coleman, J. S. (1971): "Control of Collectives and the Power of a Collectivity to Act," in *Social Choice*, ed. by B. Lieberman, pp. 192–225. Gordon and Breach, New York.

European Parliament (2010): "Definitive adoption of the European Union's general budget for the financial year 2010," *Official Journal of the European Union*, 53, 1.

Eurostat (2009): "EUROPOP2008 - Convergence scenario, national level, Population predictions - [tps00002]," .

Felsenthal, D. S., and M. Machover (1998): *The Measurement of Voting Power: Theory and Practice, Problems and Paradoxes*. Edward Elgar, Cheltenham.

——— (2001): "The Treaty of Nice and Qualified Majority Voting," *Social Choice and Welfare*, 18(3), 431–464.

——— (2004): "A priori voting Power: What is it all about?," *Political Studies Review*, 2(1), 1–23.

——— (2007): "Analysis of QM Rule adopted by the Council of the European Union, Brussels, 23 June 2007," Eprint 2531, London School of Economics, London.

George, M. V., S. K. Smith, D. A. Swanson, and J. Tayman (2004): "Population Projections," in *The Methods and Materials of Demography*, ed. by J. Siegel, and D. Swanson, chap. 21. Elsevier, San Diego.

Hosli, M. O. (2008): "Council Decision Rules and European Union Constitutional Design," *AUCO Czech Economic Review*, 2(1), 76–96.

Kóczy, L. Á. (2010): "Strategic Aspects of the 1995 and 2004 EU Enlargements," *Group Decision and Negotiation*, 19(3), 267–277.

Leech, D. (2002): "Designing the Voting System for the Council of the European Union," *Public Choice*, 113(3–4), 437–434.

Mahony, H. (2007): "EU leaders scrape treaty deal at 11th hour," *EU Observer*, 23 June 2007.

Penrose, L. S. (1946): "The elementary statistics of majority voting," *Journal of the Royal Statistical Society*, 109(1), 53–57.

Shapley, L. S. (1953): "A value for n-person games," in *Contributions to the Theory of Games II*, ed. by H. W. Kuhn, and A. W. Tucker, vol. 28 of *Annals of Mathematics Studies*, pp. 307–317. Princeton University Press, Princeton.

Shapley, L. S., and M. Shubik (1954): "A method for evaluating the distribution of power in a committee system," *American Political Science Review*, 48(3), 787–792.

Słomczyński, W., and K. Życzkowski (2004): "Voting in the European Union: The square root system of Penrose and a critical point," cond-mat 0405396v2, arXiv.org, Warsaw.

——— (2006): "Penrose voting system and optimal quota," *Acta Physica Polonica B*, 37, 3133.

Straffin, Jr., P. D. (1977): "Homogeneity, Independence and Power Indices," *Public Choice*, 30, 107–118.

Turnovec, F. (2008): "National, Political and Institutional Influence in European Union Decision Making," *AUCO Czech Economic Review*, 2(2), 154–173.

A Tables

	2010	2015	2020	2030	2035	2040	2045	2050	2055	2060
Austria	2,81	1,99	1,98	1,98	2,02	2,04	2,05	2,06	2,07	2,08
Belgium	3,40	2,38	2,37	2,38	2,44	2,47	2,49	2,52	2,55	2,56
Bulgaria	2,81	1,81	1,79	1,75	1,70	1,66	1,63	1,61	1,59	1,57
Cyprus	1,10	0,82	0,82	0,83	0,85	0,86	0,88	0,88	0,90	0,91
Czech Republic	3,40	2,29	2,28	2,26	2,24	2,22	2,22	2,20	2,19	2,17
Denmark	1,95	1,54	1,53	1,53	1,55	1,57	1,57	1,58	1,59	1,60
Estonia	1,10	0,88	0,88	0,88	0,88	0,87	0,88	0,88	0,89	0,89
Finland	1,95	1,51	1,50	1,50	1,52	1,52	1,51	1,52	1,51	1,52
France	8,71	11,17	11,20	11,31	11,60	11,77	11,95	12,11	12,28	12,47
Germany	8,76	15,04	15,12	14,79	14,23	13,95	13,64	13,32	13,03	12,72
Greece	3,40	2,44	2,43	2,43	2,42	2,42	2,43	2,43	2,43	2,42
Hungary	3,40	2,21	2,20	2,17	2,13	2,10	2,09	2,07	2,07	2,05
Ireland	1,95	1,46	1,45	1,49	1,56	1,60	1,62	1,65	1,68	1,72
Italy	8,70	10,53	10,54	10,49	10,40	10,38	10,36	10,33	10,28	10,20
Latvia	1,10	1,01	1,01	1,01	0,99	0,99	0,98	0,98	0,98	0,97
Lithuania	1,95	1,19	1,18	1,16	1,15	1,13	1,12	1,12	1,11	1,10
Luxembourg	1,10	0,77	0,76	0,77	0,78	0,78	0,80	0,81	0,81	0,82
Malta	0,81	0,75	0,75	0,74	0,75	0,75	0,76	0,76	0,77	0,78
Netherlands	3,67	3,26	3,27	3,28	3,32	3,33	3,32	3,32	3,30	3,28
Poland	7,99	6,52	6,53	6,45	6,21	6,06	5,92	5,80	5,67	5,53
Portugal	3,40	2,35	2,34	2,35	2,38	2,39	2,42	2,43	2,43	2,44
Romania	3,98	3,97	4,01	3,93	3,77	3,71	3,65	3,58	3,50	3,43
Slovakia	1,95	1,51	1,50	1,49	1,47	1,46	1,45	1,44	1,44	1,42
Slovenia	1,10	1,00	0,99	0,99	0,99	0,99	0,99	0,98	0,99	0,98
Spain	8,04	8,35	8,34	8,51	8,61	8,62	8,64	8,65	8,64	8,61
Sweden	2,81	2,14	2,13	2,17	2,22	2,24	2,26	2,29	2,31	2,34
UK	8,71	11,09	11,11	11,33	11,84	12,12	12,38	12,68	13,03	13,40

Table 6: Shapley-Shubik indices of the member countries (in %)

	2010	2015	2020	2030	2035	2040	2045	2050	2055	2060
Austria	3,09	2,55	2,56	2,57	2,58	2,57	2,58	2,58	2,58	2,58
Belgium	3,68	2,84	2,86	2,87	2,89	2,89	2,90	2,90	2,90	2,92
Bulgaria	3,09	2,40	2,34	2,32	2,29	2,27	2,25	2,23	2,22	2,21
Cyprus	1,25	1,63	1,65	1,67	1,68	1,70	1,72	1,74	1,75	1,76
Czech Republic	3,68	2,77	2,75	2,73	2,71	2,69	2,67	2,66	2,64	2,63
Denmark	2,18	2,19	2,19	2,21	2,22	2,22	2,23	2,23	2,24	2,25
Estonia	1,25	1,68	1,68	1,69	1,69	1,70	1,72	1,73	1,74	1,74
Finland	2,18	2,17	2,17	2,18	2,18	2,18	2,18	2,18	2,19	2,20
France	7,78	8,98	9,17	9,28	9,39	9,51	9,61	9,71	9,81	9,91
Germany	7,78	11,31	10,98	10,82	10,65	10,47	10,29	10,13	9,95	9,79
Greece	3,68	2,89	2,87	2,86	2,85	2,85	2,83	2,82	2,81	2,80
Hungary	3,68	2,71	2,67	2,65	2,62	2,61	2,59	2,58	2,56	2,55
Ireland	2,18	2,13	2,19	2,22	2,24	2,26	2,28	2,30	2,33	2,35
Italy	7,78	8,56	8,55	8,55	8,58	8,60	8,62	8,61	8,59	8,54
Latvia	1,25	1,78	1,77	1,77	1,78	1,78	1,79	1,79	1,79	1,81
Lithuania	2,18	1,92	1,90	1,90	1,89	1,89	1,89	1,89	1,89	1,89
Luxembourg	1,25	1,58	1,60	1,61	1,62	1,65	1,66	1,67	1,69	1,70
Malta	0,94	1,57	1,57	1,59	1,60	1,61	1,63	1,64	1,65	1,67
Netherlands	3,97	3,51	3,51	3,50	3,48	3,45	3,43	3,39	3,37	3,36
Poland	7,42	5,35	5,05	4,91	4,76	4,61	4,49	4,39	4,32	4,28
Portugal	3,68	2,82	2,83	2,83	2,83	2,84	2,83	2,82	2,82	2,82
Romania	4,26	4,04	3,91	3,82	3,74	3,67	3,60	3,52	3,46	3,39
Slovakia	2,18	2,17	2,16	2,15	2,14	2,13	2,13	2,13	2,11	2,10
Slovenia	1,25	1,77	1,76	1,77	1,78	1,79	1,79	1,80	1,80	1,82
Spain	7,42	7,10	7,36	7,42	7,49	7,56	7,63	7,68	7,71	7,68
Sweden	3,09	2,66	2,70	2,72	2,72	2,73	2,74	2,75	2,76	2,78
UK	7,78	8,93	9,26	9,43	9,61	9,76	9,94	10,13	10,31	10,48
decisiveness	2,03	12,80	12,70	12,71	12,69	12,69	12,69	12,67	12,67	12,71

Table 7: The normalised Banzhaf indices and the decisiveness (in %)